

## REMARKS

Claims 1-92 and 100-120 are pending in the application. Claims 93-99 and 121 have been withdrawn. Thus, claims 1-92 and 100-120 are pending in the application.

Claims 1, 16, 30, 44, 57, and 67 have been amended to change “nearly identical” to “reasonable resembles” and/or to correct minor typographical errors. None of the aforementioned amendments were made to overcome prior art. The amendment does not include new matter and is not related to patentability, but corrects a typographical omission. Support for the amendment may be found in the specification as filed in numerous places, such as paragraph 26, 27, and 28.

## **RESTRICTION REQUIREMENT:**

Applicant elects group 1 claims 1-92 and 100-120 with traverse. Applicant reserves the right to file one or more divisional applications directed to the non-elected subject matter of the remaining claims in this application.

## **NON-OBVIOUSNESS UNDER 35 U.S.C. §103(A)**

The Office Action rejected Claims 1-92 and 100-120 under 35 U.S.C. 103(a) as allegedly unpatentable over Vierheilig U.S. 6,028,023 ('023 reference).

The Office Action alleged that Vierheilig '023 reference “discloses a material for use in a FCC process comprising, hydrotalcite-like compound with the formula  $(X^{2+}_m Y^{3+}_n (OH)_{2m+2n}) OH_n \cdot bH_2O$ , wherein  $X^{2+}$  and  $Y^{3+}$  are cations, m and n are selected such that the ratio of m/n is about 1 to about 10, a will have a value of 1, 2, or 3, b will range from 0 and 10, where the X is Mg, Ca, Zn, Mn, Co, Ni, Sr, Ba, Fe, or Cu and the Y is Al, Mn, Fe, Co, Ni, Cr, Ga, B, La, or Ce (see Vierheilig, column 12, lines 15-27).” (6/28/2006 Office Action Page 4)

With respect to claims 77-80, the Office Action alleged Vierheilig '023 "discloses where a Hydrotalcite-like compound is used in an FCC catalyst to remove **sulfur** from petroleum (see Vierheilig, column 15, lines 16-27) and where the Mg/Al ratio is between 2:1 to 5:1 and has an XRD pattern with a reflection at a two theta peak position at about 43 degrees and about 62 degrees (see Vierheilig, column 20, line 66 – column 21, line 6 and Figure 10)." (6/28/2006 Office Action Page 6)

With respect to claims 104, 106-108, 114-115, the Office Action alleged Vierheilig '023 "discloses where a Hydrotalcite-like compound is used in an FCC catalyst to remove **sulfur** from petroleum (see Vierheilig column 15, lines 16-27) and where the Mg/Al ratio is between 2:1 to 5:1 and has an XRD pattern with a reflection at a two theta peak position at about 43 degrees and about 62 degrees (see Vierheilig, column 20, line 66 – column 21, line 6 and Figure 10 and MPEP 2144.05.I.)." (6/28/2006 Office Action Page 6)

However, the Office Action *incorrectly* cites Vierheilig '023 column 15 lines 16-2 as disclosing removing **sulfur**. Vierheilig '023 (in col 15 lines 16-27) expressly discloses sorbing **SO<sub>x</sub>** and does not disclose removing **sulfur** as *correctly* quoted below:

"Thus, using **SO<sub>x</sub>** sorption in a FCC unit used to refine petroleum as an example, the method of extending the useful life of an **SO<sub>x</sub>** sorbent (or catalyst) may be expressed in patent claim language in the following manner:

A method for extending the useful life of a **SO<sub>x</sub>** sorbent system used in a FCC unit being employed to refine a petroleum feedstock, said method comprising: employing a HTL compound made by use of a process of this patent disclosure as a **SO<sub>x</sub>** sorbent system in the FCC unit and wherein the HTL compound is in the form of a microspheroidal particle species whose primary function is sorbing **SO<sub>x</sub>** produced by refining a sulfur-containing petroleum."

Thus, in contrast to the alleged Office Action, the Vierheilig '023 reference does not disclose reducing the concentration of **sulfur** in gasoline. The reference only discloses sorbing **SO<sub>x</sub>**.

To establish a prima facie case of obviousness, the MPEP explicitly *requires* the Examiner to demonstrate all the following three criteria. First, there *must* be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of

ordinary skill in the art, to modify the reference or to combine to the reference teachings. Second, there *must* be a reasonable expectation of success. Finally, the prior art reference (or references when combined) *must* teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP § 2143 -§ 2143.03 .

“The initial *burden is on the examiner* to provide some suggestion or motivation to modify.” Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985); See MPEP § 2144 -§ 2144. When the motivation to combine the teachings of the references is not immediately apparent, it is the *duty of the examiner* to explain why the combination of the teachings is proper.

**No motivation to modify or any reasonable expectation of success in the reference to disclose reducing the concentration of *sulfur* in gasoline**

In this case, even though the '023 reference expressly states removing **SO<sub>x</sub>** as opposed to reducing **sulfur** from gasoline, the Office Action nonetheless merely and erroneously alleged it would have been obvious to reduce the concentration of **sulfur** in gasoline in view of the reference. The test for non-obviousness is not whether it would be merely advantageous or possible to combine references but whether the prior art suggests the motivation to combine the references. “[T]he mere fact that the references can be combined or modified does not make the resultant combination obvious unless the prior art suggests the desirability of the combination”. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990); See MPEP section 2143.01. Consequently, Applicant respectfully submits that the claims are not obvious because the Office Action has not demonstrated why one of ordinary skill in the art would have been motivated to modify the reference to reduce the concentration of **sulfur** in gasoline. Nor has the Office Action demonstrated a reasonable expectation of success in modifying the reference to reduce the concentration of **sulfur** in gasoline.

One skilled in the art would consider that **SO<sub>x</sub>** sorption occurs in the regenerator in an oxidizing environment as the coke is burned. (see also paragraph 4 of the specification as filed ).

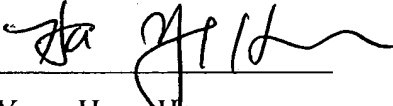
In contrast, **sulfur** reduction in gasoline occurs in the reactor ((i.e. riser) in a reducing environment before, during, or after the cracking step. Applicant's specification as filed states, in several places such as paragraph 38, 50 and 56, a method for **reducing the concentration of sulfur in gasoline** produced in an FCC unit by providing a hydrotalcite like compound. Applicant also claims methods (see independent claims 1, 16, 30, 44, 57, 77, 100 and 104) for **reducing the concentration of sulfur in gasoline** produced in an FCC unit, as opposed to reducing  $SO_x$ , during the cracking process which occurs in the riser or reactor, and not the regenerator as discussed above. Thus, although the '023 reference may disclose sorbing  $SO_x$ , the '023 reference, however, does not disclose a method for **reducing the concentration of sulfur in gasoline**, as erroneously cited in the Office Action discussed in detail above.

Consequently, applicant respectfully submits that the independent claims 1, 16, 30, 44, 57, 77, 100 and 104 are not obvious. Applicant respectfully submits that as the current independent claims are allowable, the claims which depend from the independent claims are also allowable.

Applicant respectfully requests that the Examiner consider the foregoing remarks, and allow the pending claims to issue. Applicant respectfully requests a telephone interview to help expedite the successful prosecution of the claims; applicant's undersigned attorney would be grateful for the opportunity to discuss any outstanding issues.

Respectfully submitted,  
Wilmer Cutler Pickering  
Hale and Dorr LLP

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Yung-Hoon Ha  
Reg. No. 56,368  
Agent for Applicant

Wilmer Cutler Pickering  
Hale and Dorr LLP  
300 Park Avenue  
New York, New York 10022  
Tel: (212) 937-7200  
Fax: (212) 937-7300